Data Repository Datasets: Exam 3
Dictionary: Created Variables

All created analytic variables have the letter "C" appended to the variable name in order to indicate that it is a created variable, rather than a variable that is directly obtained as part of the MESA exam.

Personal Characteristics

Age (truncated to the nearest whole number)
AGE3C = TRUNC ((visitdt3 – birthdate) / (60 * 60 * 24 * 365.25)).

Ten-year age groups

AGECAT3C = 1	age = 45-54 years
AGECAT3C = 2	age = 55-64 years
AGECAT3C = 3	age = 65-74 years
AGECAT3C = 4	age = 75-84 years

Body mass index [BMI; weight (kg) / height $(m)^2$] by WHO categories; reference 1
BMI3C = (wtlb3 * 0.4536) / ((htcm3 / 100) ^ 2)

Body mass index categories

BMI3C < 25	BMICAT3C =1	Normal
BMI3C >= 25 and BMI3C < 30	BMICAT3C =2	Grade 1 Overweight
BMI3C >= 30 and BMI3C < 40	BMICAT3C =3	Grade 2 Overweight
BMI3C >= 40	BMICAT3C =4	Grade 3 Overweight

Body surface area (BSA)
BSA3C = 0.20247 * ((htcm3 / 100) ^ (0.725)) * ((wtlb3 * 0.4536) ^ (0.425)).
(^ indicates the value of the exponent; e.g., the second term in the equation is height(m) to the 0.725 power):

Cigarette smoking status

CIG3C = 0	Never	if smkstat3= 0
CIG3C = 1	Former	if ((smkstat3 = 1 or smkstat3 = 2) OR (cig2c > 0))
CIG3C = 2	Current	if cursmk3 = 1

("Ever" is defined as >= 100 cigarettes in your lifetime; current is defined as smoking cigarettes within the past 30 days)

Data Repository Datasets: Exam 3
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Personal Characteristics (continued)

Current aspirin use (taking aspirin at least 3 days per week at baseline)

ASACAT3C = 0 Not taking aspirin

ASACAT3C = 1 If ASA3C = 1 and ASPDAYS3 >=3

Prevalent Disease Measures

Systolic blood pressure, average of 2nd and 3rd Dinamap measurements, in mm Hg

SBP3C = average (s2bp3, s3bp3)

Diastolic blood pressure, average of 2nd and 3rd Dinamap measurements, in mm Hg

DBP3C = average (d2bp3, d3bp3)

Hypertension by JNC VI (1997) criteria

```
RECODE highbp2 highbp_f1 highbp_f2 highbp_f3 highbp_f4 highbp_F5 highbp_f6
(-9=SYSMIS)  (9=SYSMIS).
EXECUTE.

COMPUTE highbp_ex3 = $SYSMIS.
EXECUTE.

IF (highbp2=0) highbp_ex3 = 0.
IF (highbp2=1) highbp_ex3 = 1.
EXECUTE.

IF (highbp_f1=1 & DATEDIFF(visitDt3,ghdt_f1,"days")>0) highbp_ex3 = 1 .
IF (highbp_f2=1 & DATEDIFF(visitDt3,ghdt_f2,"days")>0) highbp_ex3 = 1 .
IF (highbp_f3=1 & DATEDIFF(visitDt3,ghdt_f3,"days")>0) highbp_ex3 = 1 .
IF (highbp_f4=1 & DATEDIFF(visitDt3,ghdt_f4,"days")>0) highbp_ex3 = 1 .
IF (highbp_f5=1 & DATEDIFF(visitDt3,ghdt_f5,"days")>0) highbp_ex3 = 1 .
IF (highbp_f6=1 & DATEDIFF(visitDt3,ghdt_f6,"days")>0) highbp_ex3 = 1 .
EXECUTE.

COMPUTE htn3c = $SYSMIS.
EXECUTE.
```

Prevalent Disease Measures (continued)

Hypertension by JNC VI (1997) criteria *(continued)*

```
IF (dbp3c>=90 | sbp3c>=140 | (highbp_ex3=1 & htnmed3c=1)) htn3c = 1.
EXECUTE.
IF (dbp3c<90 & sbp3c<140 & MISSING(htn3c)=1) htn3c = 0.
EXECUTE.
IF (htn3c=0 & MISSING(highbp_ex3)=1 & htnmed3c=1) htn3c = $SYSMIS.
EXECUTE.
IF (htn3c=0 & highbp_ex3=1 & MISSING(htnmed3c)=1) htn3c = $SYSMIS.
EXECUTE.
```

Ankle-brachial index = minimum ratio of ankle BP to brachial (arm) BP. Ratios are calculated separately for the left and right side, and the minimum is then selected.

ABI3C = min (rtabi , ltabi)

where rtabi = (max (rdpedis3, rptib3)) / (avg (rbrach3,lbrach3))
ltabi = (max (ldpedis3, lptib3)) / (avg (rbrach3,lbrach3))

For rtabi and ltabi, if the two brachial (arm) BPs differ by 10 mmHg or more, use the higher arm pressure as the denominator.

Diabetes mellitus by 2003 ADA fasting criteria

DM033C	= 3	Treated diabetes defined as: (i) use of insulin or ohga on medication form, or (ii) self-report of insulin/ohga us on medical history form and on the phlebotomy form
DM033C	= 2	Untreated diabetes if fasting glucose >= 126 mg/dL and DM033C not equal to 3 (above).
DM033C	= 1	impaired fasting glucose if fasting glucose = 100-125 mg/dL and DM033C not equal to 3 (above).
DM033C	= 0	normal if fasting glucose is < 100 mg/dL and DM033C not equal to 3 (above).

Prevalent Disease Measures (continued)

Framingham risk, NCEP version (frncep3c)

fr_totc: This variable measures the points for calculating 10-year risk of developing hard CHD (MI and CHD death). It is not included in the dataset; rather, it is used for calculating **frncep3c**. This measure relies upon age [**age3c**], total cholesterol [**chol3**], current smoking status [**cig3c**], hdl [**hdl3**], systolic blood pressure [**sbp3c**] and presence of hypertension medication [**htnmed3c**] for its calculations. Men and women [**gender1**] are scored separately. No adjustment has been made for participant use of lipid lowering medications at the time of blood draw. This measure should not be used in analysis; use the Framingham 10-year risk of CHD instead. To find the Framingham risk point score, sum the points from the tables below. For example, a male, age 66, cholesterol 232, HDL 54, smoker, and systolic blood pressure of 132 without hypertension treatments will have a point score of 11+1+0+1+1=14.

A missing value sets this entire variable to be missing, unless the missing value would have no effect on the total points. (missing **htnmed3c** when **sbp3c** is less than 120, for example) This scoring algorithm is oriented towards cholesterol treatment decisions. Since diabetes is considered a CHD risk-equivalent, diabetics are automatically recommended for treatment, and the risk scoring does not include diabetes as a factor. For this reason, the 10 year risk estimates do not apply to diabetics, and this variable is set to missing for anyone with **glucose3** >=126 mg/dl or on diabetes treatment. [**dm033c**=2 or 3] The algorithm is also only applicable for ages<80, however, for ages 80-85 we assigned them a risk as though they were age 79.

NOTE: Tables and methods taken directly from NCEP summary, reference #4.

Prevalent Disease Measures (continued)

Framingham risk, NCEP version (frncep3c) *(continued)*

Framingham Point Scores for Men

Age point distribution

[**age3c**]	Points
45-49	3
50-54	6
55-59	8
60-64	10
65-69	11
70-74	12
75-79	13
80+	undefined

Cholesterol point distribution, varies by age

	[**age3c**]			
[**chol3**]	40-49	50-59	60-69	70-79
<160	0	0	0	0
160-199	3	2	1	0
200-239	5	3	1	0
240-279	6	4	2	1
280+	8	5	3	1

HDL point distribution

[**hdl3**]	points
60+	-1
50-59	0
40-49	1
<40	2

Smoking point distribution, varies by age

	[**age3c**]			
[**cig3c**]	40-49	50-59	60-69	70-79
Nonsmoker [**cig3c=0,1**]	0	0	0	0
Current smoker [**cig3c=2**]	5	3	1	1

Systolic blood pressure point distribution, varies by hypertension status

	Hypertension status	
[**sbp3c**]	Untreated [**htnmed3c=0**]	Treated [**htnmed3c=1**]
<120	0	0
120-129	0	1
130-139	1	2
140-159	1	2
160+	2	3

Prevalent Disease Measures (continued)

Framingham risk, NCEP version (frncep3c) *(continued)*

Framingham Point Scores for Women

Age point distribution

[age3c]	Points
45-49	3
50-54	6
55-59	8
60-64	10
65-69	12
70-74	14
75-79	16
80+	undefined

Cholesterol point distribution, varies by age

	[age3c]			
[chol3]	40-49	50-59	60-69	70-79
<160	0	0	0	0
160-199	3	2	1	1
200-239	6	4	2	1
240-279	8	5	3	2
280+	10	7	4	2

HDL point distribution

[hdl3]	points
60+	-1
50-59	0
40-49	1
<40	2

Smoking point distribution, varies by age

	[age3c]			
[cig3c]	40-49	50-59	60-69	70-79
Nonsmoker [cig3c=0,1]	0	0	0	0
Current smoker [cig3c=2]	5	3	7	4

Systolic blood pressure point distribution, varies by hypertension status

	Hypertension status	
	Untreated	Treated
[sbp3c]	[htnmed3c=0]	[htnmed3c=1]
<120	0	0
120-129	1	3
130-139	2	4
140-159	3	5
160+	4	6

Prevalent Disease Measures (continued)

Framingham 10-year risk of CHD, NCEP version (frncep3c): Risk of developing hard CHD within 10 years, calculated from the NCEP Framingham risk point scores. Men and women use different tables to find their values:

Framingham 10-Year Risk Percentages for Men

Point Total	10-Year Risk, %	
<0	<1	*coded as 0
0	1	
1	1	
2	1	
3	1	
4	1	
5	2	
6	2	
7	3	
8	4	
9	5	
10	6	
11	8	
12	10	
13	12	
14	16	
15	20	
16	25	
17+	30+	*coded as 0.30

All values are coded as decimals; 12% is coded as 0.12

Framingham 10-Year Risk Percentages for Women

Point Total	10-Year Risk, %	
<9	<1	*coded as 0
9	1	
10	1	
11	1	
12	1	
13	2	
14	2	
15	3	
16	4	
17	5	
18	6	
19	8	
20	11	
21	14	
22	17	
23	22	
24	27	
25+	30+	*coded as 0.30

From the previous example, the man with a point score of 14 has an estimated probability of 16% with regards to experiencing a CHD in 10 years. The actual value of frncep3c would be 0.16
NOTE: Tables and methods taken directly from NCEP summary, reference #4.

Prevalent Disease Measures (continued)

Framingham risk, JAMA version (frjama3c)
Risk of developing hard CHD within 10 years, calculated from the JAMA Framingham risk survival model. These scores were developed using Cox proportional hazards models, using a separate model for each gender. The models are not recalibrated to the MESA data; the average values of the Framingham covariates are used and the published Framingham average incidence rates are used. The variables used in calculating FRJAMA3c are **age3c**, **htnstg3c**, **chol3**, **hdl3**, **dm033c**, **glucos3c**, **cig3c** and **gender1**. The algorithm is only applicable for ages<75, however, however for older participants we assigned them a risk as though they were age 74. The survival model's means and coefficients are provided from the JAMA Framingham Cox regression.

Framingham risk, Circulation version (frcirc3c)
Estimated 10 year risk of all CHD events by Framingham equation published in Circulation in 2001 [7]. This algorithm is very similar to that used in FRJAMA3c above, only predicting all CHD (MI, CHD death, angina) instead of hard CHD. The same risk factors and modeling strategy are used for both. The algorithm is only applicable for ages<75, however, however for older participants we assigned them a risk as though they were age 74.

NECP Metabolic Syndrome (metsyn3c)
Must have 3 or more of the following risk factors

1.) Increase waist size
waistcm3 > 102 cm if gender1 = 1
waistcm3 > 88 cm if gender1 = 0

2.) Elevated Triglycerides
trig3 >= 150mg/dl

3.) Low HDL cholesterol
hdl3 < 40 mg/dl if gender1 = 1
hdl3 < 50 mg/dl if gender1 = 0

4.) Hypertension
defined as dbp3c >= 85 or sbp3c >= 130 or htnmed3c = 1

5.) Impaired fasting glucose
glucos3c >= 110 mg/dl or diabet3 = 1

Data Repository Datasets: Exam 3
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Blood Lab Measures

NOTE: All lipid categories determined by NCEP 2001 guidelines; reference 4

Total Cholesterol, NCEP Categories

CHLCAT3C = 3	High	Cholesterol ≥ 240 mg/dL
CHLCAT3C = 2	Borderline High	Cholesterol 200-239 mg/dL
CHLCAT3C = 1	Desirable	Cholesterol < 200 mg/dL

LDL Cholesterol, NCEP Categories

LDLCAT3C = 5	Very High	LDL cholesterol ≥ 190 mg/dL
LDLCAT3C = 4	High	LDL cholesterol 160-189 mg/dL
LDLCAT3C = 3	Borderline High	LDL cholesterol 130-159 mg/dL
LDLCAT3C = 2	Near Optimal	LDL cholesterol 100-129 mg/dL
LDLCAT3C = 1	Optimal	LDL cholesterol < 100 mg/dL

HDL Cholesterol, NCEP Categories

HDLCAT3C= 3	Low	HDL < 40 mg/dL
HDLCAT3C= 2		HDL 40-59 mg/dL
HDLCAT3C= 1	High	HDL ≥ 60 mg/dL

Triglycerides, NCEP Categories

TRICAT3C = 4	Very High	Triglycerides ≥ 500 mg/dL
TRICAT3C = 3	High	Triglycerides 200-499 mg/dL
TRICAT3C = 2	Borderline High	Triglycerides 150-199 mg/dL
TRICAT3C = 1	Normal	Triglycerides < 150 mg/dL

Calibrated Fasting Glucose Value

glucos3c = Intercept + (Slope x Original Fasting Glucose value).

Linear Regression determines Intercept and Slope values

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT glucos3r
  /METHOD=ENTER glucos3u.
execute.
```

Urinary Measures

Urinary Microalbuminuria from spot urine measurement, albumin (mg) / creatinine (g); reference 5

UABCAT3C = 3	Macroalbuminuria	alb(mg)/cre(g)	> 300
UABCAT3C = 2	Microalbuminuria	alb(mg)/cre(g)	30-300
UABCAT3C = 1	Normal	alb(mg)/cre(g)	< 30

Seated Blood Pressure

```
COMPUTE hrdina3c = mean (hr2dina3, hr3dina3).
VARIABLE LABELS hrdina3c 'SEATED HEART RATE (beats per min)'.
EXECUTE.
```

Data Repository Datasets: Exam 3
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CT Measures

Each of the measures below is the sum of the corresponding measures from the left anterior descending, circumflex, left and right coronary arteries.

1) Agatston calcium score

a) Unadjusted = slft3 + slad3 + scrc3 + srt3

AGATU3C	Defined for each scan (CT RC data file)
AGATU13C	Scan 1, defined for each participant (main data file)
AGATU23C	Scan 2, defined for participants with 2 scans (main data file)
AGATUM3C	mean (AGATU13C, AGATU23C), average of scans 1 and 2 (main data file)

b) Phantom-adjusted = pslft3 + pslad3 + pscrc3 + psrt3 if PHOK3C=1
= slft3 + slad3 + scrc3 + srt3 if PHOK3C=0

AGATP3C	Defined for each scan (CT RC data file)
AGATP13C	Scan 1, defined for each participant (main data file)
AGATP23C	Scan 2, defined for participants with 2 scans (main data file)
AGATPM3C	mean (AGATP13C, AGATP23C), average of scans 1 and 2 (main data file)

2) Total calcium volume

a) Unadjusted = vlft3+ vlad3 + vcrc3 + vrt3

VOLU13C	Scan 1, defined for each participant (main data file)
VOLU23C	Scan 2, defined for participant w/ 2 scans (main data file)
VOLUM3C	mean (VOLU13C, VOLU23C), average of scans 1 and 2 (main data file)

b) Phantom-adjusted = pvlft3+pvlad3+pvcrc3+pvrt3 if PHOK3C=1
= vlft3+ vlad3 + vcrc3 + vrt3 if PHOK3C=0

VOLP13C	Scan 1, defined for each participant (main data file)
VOLP23C	Scan 2, defined for participants w/ 2 scans (main data file)
VOLPM3C	mean (VOLP13C, VOLP23C), average of scans 1 and 2 (main data file)

3) Total isometric volume score

a) Unadjusted = vslft3 + vslad3 + vscrc3 + vsrt3

VOLSU13C	Scan 1, defined for each participant (main data file)
VOLSU23C	Scan 2, defined for participant w/ 2 scans (main data file)
VOLSUM3C	mean (VOLSU13C, VOLSU23C), average of scans 1 and 2 (main data file)

b) Phantom-adjusted = pvslft3 + pvslad3 + pvscrc3 + pvsrt3 if PHOK3C=1
= vslft3 + vslad3 + vscrc3 + vsrt3 if PHOK3C=0

VOLSP13C	Scan 1, defined for each participant (main data file)
VOLSP23C	Scan 2, defined for participants w/ 2 scans (main data file)

c) Phantom-adjusted, Mean Total Volume Score = MEAN(VOLSP3C)

VOSPM3C	Mean Total Volume Score, Phantom Adjusted

WHO ROSE Intermittent Claudication

```
COMPUTE whoros3c = 0.
EXECUTE.

IF (lpcalf3=1 & lpuphl3=1 & lprest3=0 & lpstop3=1 & lprelv3=1 & lpdis3=0) whoros3c=1.
EXECUTE.

DO IF (MISSING (lpcalf3 + lpuphl3 + lprest3 + lpstop3 + lprelv3 + lpdis3)).
RECODE whoros3c (ELSE=SYSMIS).
END IF.
EXECUTE.

DO IF (legpain3=0).
RECODE whoros3c (ELSE=0).
END IF.
EXECUTE.
```

Age of Hormone Replacement Therapy Use

Former user: hrmage3c = hrmsage3 if:

- hrmsage3 < hrmrage3
  OR
- hrmsage3 > 0 and hrmrage3 is blank

Current user: hrmage3c = hrmrage3 if:

- hrmrage3 < hrmsage3
  OR
- hrmrage3 > 0 and hrmsage3 is blank

Both former and current user: hrmage3c = hrmrage3 if:

- hrmrage3 = hrmsage3

Health and Life

Spielberger trait anger scale

SPLANG3C = sum of scores for 10 items (qktempr3, frtempr3, hothead3, angry3, annoyed3, flyoff3, nasty3, furious3, frushit3, infurat3)

Assign scores 1, 2, 3, 4 from “almost never” to “almost always”.
If more than 2 items are missing, do not score.
If 1-2 items are missing, assign value of 1 to missing items.

Spielberger trait anxiety scale

SPLANX3C = sum of scores for 10 items (steady3, satisf3, nervous3, unhappy3, failure3, turmoil3, secure3, noconf3, inadeqt3, worry3)

Assign scores as follows:
For nervous1, unhappy3, failure3, turmoil3, noconf3, inadeqt3, and worry3:
Score 1, 2, 3, 4 from “almost never to almost always”.

For steady3, satisf3, and secure3:
Score 4, 3, 2, 1 from “almost never to almost always”.

If more than 2 items are missing, do not score.
If 1-2 items are missing, determine mean score across items completed, multiply by 10 and round to nearest whole number.

Chronic burden

CHRBUR3C = total number of items to which response is 1 =Yes for (hprb1pt3, hprb1ot3, job1prb3, mon1prb3, rel1prb3).

If any items are missing, do not code.

Chronic burden 6 months or more

CHRBU63C = total number of items to which response is 1 =Yes for (hprb2pt3, hprb2ot3, job2prb3, mon2prb3, rel2prb3).

If any items are missing, do not code.

Health and Life (continued)

CES-D (Center for Epidemiologic Studies – Depression) Scale

CESD3C = sum of scores for the 20 items of the CES-D Scale (bother3, noteat3, blue3, asgood3, concntr3, depress3, effort3, hopeful3, lffail3, fearful3, badslp3, happy3, lestalk3, lonely3, unfrnly3, enjlife3, cryspel3, sad3, dislikd3, getgoin3)

Assign scores as follows:
For asgood3, hopeful3, happy3, enjlife3:
Score 3, 2, 1, 0 (rarely to most)

For bother3, noteat3, blue3, concntr3, depress3, effort3, lffail3, fearful3, badslp3, lestalk3, lonely3, unfrnly3, cryspel3, sad3, dislikd3, getgoin3:
Score 0, 1, 2, 3 (rarely to most).

If more than 5 items are missing, score is not calculated.
If 1-5 items are missing, sum scores for completed items, divide total by number answered and multiply by 20.

Emotional Social Support Index

EMOT3C = sum of scores for 6 items (talkto3, advice3, affectn3, hlpchr3, emospt3, confide3).

Assign scores 1, 2, 3, 4, 5 from “none of the time” to “all of the time”.
If any items are missing, do not score.

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References:

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